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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Inventor(s): MACKIEWICH, Blair Thomas; TADSEN, Thomas; WEN, Yuming;
UNGUREANU, Radu Constantin
Title: **METHOD AND APPARATUS FOR IMPLEMENTING POINT-TO-
MULTIPOINT COMMUNICATIONS OVER A CONNECTION-BASED
DATA COMMUNICATION NETWORK**
Serial No.: 10/004313
Filed: 6 December 2001
Date: 25 August 2006

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

REMARKS

This communication is responsive to the Office Action dated 25 May 2006.

As a result of the Amendment filed 22 March 2006, claims 1-9, 11, 12, 18, 23-25, 27-31, 36-38 and 41-49 are pending in this application.

Allowable Subject Matter

Claims 8 and 18 are allowed.

Compliance with 35 U.S.C. §112

The Office Action raises 35 U.S.C. §112, first paragraph, in connection with claims 1, 36, 41 and 45. The Applicant submits that the specification, as originally filed, clearly demonstrates that the Applicant was in possession of the invention recited in claims 1, 36, 41 and 45.

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The Examiner has objected to the claim 1 feature of "the device comprising a bridge for providing a unidirectional connection between a local interface port associated with said broadcast-based network and a remote interface port associated with said connection based network." Referring to Figure 3 and to the accompanying description at p. 7, ln. 20-22, the originally filed specification describes local interface port 22 and a remote interface port 24A which are located on bridge 20. At p. 10, ln. 29, the specification discloses that when "frames are received at local interface port 22, bridge 20 forwards them to port 24A". The Applicant submits that the foregoing passage establishes a connection between local interface port 22 and remote interface 24A. At p. 11, ln. 21-26, the originally filed description states that "[t]he port 24A at the root 35 of P2MP virtual channel 30 may be designated 'ingress only'" and that "'ingress' means a direction of data flow from bridge 20 into virtual channel 30". The description further discloses, at p. 11, ln. 26 - p. 12, ln. 1, that "[p]ort 24A drops any data which is egressing from virtual channel 30." and that "'egress' refers to a direction of data flow in which data arrives at bridge 20 from virtual channel 30". The Applicant submits that the foregoing passages establish that only ingress data, that is data from bridge 20 into virtual channel 30, passes through port 24A. The Applicant further submits that because only ingress data passes through port 24A, the connection between local interface port 22 and remote interface port 24A carries only ingress data and is therefore a unidirectional connection.

Based on this reasoning, the Applicant submits that claim 1 is fully supported by the application as originally filed and complies with 35 U.S.C. §112, first paragraph. Claims 36, 41 and 45 recite similar features and the Applicant submits that the same rationale provides support for the similar features of claims 36, 41 and 45.

Claims 1-7, 9, 11, 12, 27-30 and 49

The Office Action raises US patent publication No. US 2004/0017812 (Kamo) in connection with claims 1-7, 9, 11, 12, 27-30 and 49. The Applicant submits that claims 1-7, 9, 11, 12, 27-30 and 49 patentably distinguish Kamo.

Independent claim 1 recites " a bridge for providing a *unidirectional connection* between a local interface port associated with said broadcast-based network and a remote interface port". As correctly identified by the Examiner on p. 5 of the Office Action, Kamo fails to disclose this claim 1 feature. In direct contrast to providing bridge having a bi-unidirectional connection as recited in claim 1, Kamo describes a bridge 10 having a bi-

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directional connection between an interface 15 to a ethernet LAN (labeled as LAN1) and an interface 19 to an ATM network 100 (see Figures 1 and 2 and the accompanying description paragraphs [0054] to [0056]). In paragraph [0055], Kamo describes providing a bi-directional buffer 16 (having upward and downward FIFO queues) to facilitate the bi-directional traffic between interface 15 and interface 19. In paragraph [0054], Kamo describes how interface 15 is bi-directional, such that interface 15 can forward packets to buffer 16 (if such packets are to be forwarded to ATM 100) and interface 15 can receive packets from buffer 16 and forward such packets to LAN1. In paragraph [0056], Kamo describes how interface 19 is bi-directional, such that interface 19 can transmit cells received from buffer 16 to "the connection" (ATM network 100) and interface 19 can receive cells from "the connection" (ATM network 100) and forward these cells to buffer 16.

The Examiner expresses the view (on pages 5 and 6 of the Office Action) that "it is well known in the art that a bidirectional connection may comprise of two separate unidirectional connections, one connection transmitting data in one direction, while the other connection transmit data in the reverse direction." The Office Action also states that "Kamo further discloses the concept of upward direction (LAN to ATM) and downward direction (ATM to LAN) thus providing the motivation to incorporate the unidirectional connection", and "it would have thus been obvious to use a unidirectional connection between ports whenever data is transmitted in a specified direction only, in order to fully utilize resources of the connection."

The Applicant submits that the Examiner's motivation to modify the Kamo bridge is ill-founded. If the Examiner is correct in stating that "a bidirectional channel may comprise of two *separate* unidirectional connections", then using "a unidirectional connection whenever data is transmitted in a specified direction only" does nothing to "fully utilize resources of the connection" as stated by the Examiner, because the connections are *separate*. In other words, if a bidirectional channel includes two *separate* unidirectional connections, the resources of one connection are not more fully utilized by eliminating the other connection.

The Applicant submits further that it would not be obvious to modify the Kamo bridge in the manner contended by the Examiner, because *Kamo discloses that a single interface 19 must be available to serve bi-directional traffic in both the upward direction*

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(from LAN1 to ATM network 100) and the downward direction (from ATM network 100 to LAN1). This aspect of Kamo et al. is specifically disclosed, for example, at paragraph [0055], where Kamo states “[t]he packets sent from the interface 15 are accumulated in a relevant queue. The packets accumulated in each queue are transmitted *towards the interface 19* in accordance with an indication of the control unit 20 (corresponding to a transmission bit-rate of the connection). On the other hand, the downward buffer accumulates the packets sent *from the interface 19*. The packets accumulated in the downward buffer are transmitted towards the interface 15 according to the indication of control unit 20.”

Kamo provides no teaching or suggestion that data would ever be transmitted unidirectionally. In contrast, Kamo specifically teaches away from such a feature when Kamo states, in paragraph [0052], that “bridges 10-13 shown in FIG. 1 each have the same construction.” Since all of the bridges 10-13 have the same construction, it would not make sense to modify interface 19 of bridge 10 to be unidirectional (e.g. to only transmit data), because if the other bridges 11-13 are the same as bridge 10, then bridges 11-13 will also only transmit data and there will be no data receiving bridges.

Based on this reasoning, the Applicant submits that claim 1 patentably distinguishes Kamo. Claims 2-7, 9, 11, 12, 27-30 and 49 depend from claim 1 and are submitted to be patentable over Kamo for at least this reason.

Claims 41-44

The Office Action raises the combination of Kamo and Patra et al. in connection with claims 41-44. The Applicant submits that claims 41-44 patentably distinguish the combination of Kamo and US patent No. 6,816,489 (Patra et al.).

Claim 41 recites “a bridge for transmitting variable sized data frames received from said first network at a local interface port to a first remote interface port, said bridge comprising a *unidirectional connection* between the local interface port and the first remote interface port”. As correctly pointed out by the Examiner at page 17 of the Office Action, Kamo does not disclose a bridge that provides such a unidirectional connection. For the reasons discussed above in relation to claim 1, there is no motivation or suggestion to modify the Kamo bridge to provide such a feature and it would not be obvious to modify the Kamo bridge to provide such a feature. Patra et al. fail to remedy this deficiency.

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Claim 41 further recites the combination of “[a] bridge device connected between a first network and a second network”, “a bridge for transmitting variable sized data frames received *from said first network at a local interface port to a first remote interface port*” and “a switching fabric for switching said variable sized data frames *from said first remote interface port to a plurality of output interfaces*, each of said output interfaces connected to said second network.” The Applicant submits that neither Kamo nor Patra et al. disclose or suggest such a combination of features.

The Examiner contends (on page 16 of the Office Action) that the Kamo LAN1 represents the claim 41 “first network” and that the Kamo ATM network 100 represents the claim 41 “second network”. The Examiner contends further that Kamo interface 15 (Figure 8) represents the claim 41 “local interface port” and that Kamo interface 19 represents the claim 41 “first remote interface port”. However, claim 41 recites “a switching fabric for switching said variable sized data frames *from said first remote interface port to a plurality of output interfaces*, each of said output interfaces connected to said second network”. Kamo fails to disclose or suggest such a switching fabric between interface 19 (alleged to be the claim 41 “first remote interface port”) and ATM network 100 (alleged to be the claim 41 “second network”). Kamo fails to teach or suggest a “plurality of output interfaces” which are connected between a “switching fabric” and a “second network” as recited in claim 41. Patra et al. fail to remedy these deficiencies.

Claim 41 further recites “enabling configuration of a point-to-multipoint virtual channel with a root at said bridge and *a plurality of leaves each connected to one of said output interfaces*.” The Examiner expresses the view (on page 16 of the Office Action) that the lines labeled “to BRIDGE 23”, “to BRIDGE 24” and “to BRIDGE 25” (Figure 8 of Kamo) represent the claim 41 “output interfaces”. However, Figure 8 of Kamo clearly shows that these lines are “P-to-P” (i.e. point to point) connections and are not a “point-to-multipoint virtual channel” as recited in claim 41. Figure 8 of Kamo does show another line extending from interface 19 that is labeled “P-to-MP” (i.e. point-to-multipoint). However, claim 41 recites “a plurality of leaves *each connected to one of said output interfaces*” (i.e. one output interface corresponding to each of the plurality of leaves). Kamo fails to disclose a point-to-multipoint connection where each of a plurality of leaves are connected to a corresponding “output interface” having the features recited in claim 41. In direct contrast to this claim 41 feature, Kamo describes a single P-to-MP “output interface” (Figure 8) with copying and switching (i.e. to direct signals to the multiple leaves) occurring within

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ATM network 100 (see Figure 6, switch elements 102, 104). Patra et al. fail to remedy this deficiency.

Based on this reasoning, the Applicant submits that claim 41 patentably distinguishes the combination of Kamo and Patra et al. Claims 42-44 depend from claim 41 and are submitted to be patentable over the combination of Kamo and Patra et al.

Claims 45, 47 and 48

The Office Action raises Kamo in connection with claims 45, 47 and 48. The Applicant submits that claims 45, 47 and 48 patentably distinguish Kamo.

Claim 45 recites "a bridge associated with each of the segments, each bridge connecting a corresponding one of the segments to the connection-based network, wherein a first bridge associated with a first one of the segments comprises a local interface port connected to the first segment and a plurality of remote interface ports, each remote interface port capable of being connected to a virtual channel in the connection-based network, said first bridge providing *a unidirectional connection* between said local interface port and a first remote interface port". As correctly pointed out by the Examiner at page 9 of the Office Action, Kamo does not disclose a bridge that provides such a unidirectional connection. For the reasons discussed above in relation to claim 1, there is no motivation or suggestion to modify the Kamo bridge to provide such a feature and it would not be obvious to modify the Kamo bridge to provide such a feature.

Accordingly, the Applicant submits that claim 45 patentably distinguishes Kamo. Claims 47 and 48 depend from claim 45 and are submitted to be patentable over Kamo for at least this reason.

Claims 23-25, 31 and 46

The Office Action raises the combination of Kamo and US patent No. 5,812,552 (Arora et al.) in connection with claims 23-25, 31 and 46. The Applicant submits that claims 23-25, 31 and 46 patentably distinguish the combination of Kamo and Arora et al.

Claims 23-25 and 31 depend from claim 1. As discussed above, Kamo fails to teach or suggest the claim 1 feature of " a bridge for providing *a unidirectional connection* between a local interface port associated with said broadcast-based network and a remote

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interface port" and there is no motivation or suggestion to modify the Kamo system to provide such a feature. Arora et al. fail to remedy this deficiency.

Claim 46 depends from claim 45. As discussed above, Kamo fails to teach or suggest the claim 45 feature of "said first bridge providing *a unidirectional connection* between said local interface port and a first remote interface port" and there is no motivation or suggestion to modify the Kamo system to provide such a feature. Arora et al. fail to remedy this deficiency.

Based on this reasoning, the Applicant submits that 23-25, 31 and 46 patentably distinguish the combination of Kamo and Arora et al.

Claims 36 and 37

The Office Action raises the combination of Kamo and Patra et al. in connection with claims 36 and 37. The Applicant submits that claims 36 and 37 patentably distinguish the combination of Kamo and Patra et al.

Claim 36 recites "at a first bridge connected to the source segment, providing *a unidirectional connection* between a local interface port associated with said source segment of the virtual network and a first remote interface port associated with said connection-based network." As correctly pointed out by the Examiner at page 14 of the Office Action, Kamo does not disclose a bridge that provides such a unidirectional connection. For the reasons discussed above in relation to claim 1, there is no motivation or suggestion to modify the Kamo bridge to provide such a feature. Patra et al. fail to remedy this deficiency.

Based on this reasoning, the Applicant submits that claim 36 patentably distinguishes the combination of Kamo and Patra et al. Claim 37 depends from claim 36 and is submitted to be patentable over the combination of Kamo and Patra et al. for at least this reason.

Claim 38

The Office Action raises the combination of Kamo, Patra et al. and Arora et al. in connection with claim 38. The Applicant submits that claim 38 patentably distinguishes the combination of Kamo, Patra et al. and Arora et al.

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Claim 38 depends from claim 36. As discussed above, Kamo fails to teach or suggest the claim 36 feature of "at a first bridge connected to the source segment, providing a *unidirectional connection* between a local interface port associated with said source segment of the virtual network and a first remote interface port associated with said connection-based network" and there is no motivation or suggestion to modify the Kamo system to provide such a feature. Neither Patra et al. nor Arora et al. remedy this deficiency.

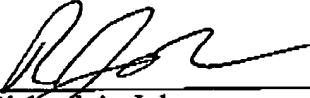
Based on this reasoning, the Applicant submits that claim 38 patentably distinguishes the combination of Kamo, Patra et al. and Arora et al.

Conclusions

Reconsideration and allowance of this application are respectfully requested in view of the foregoing remarks.

Respectfully submitted,
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